

Nutrition: Anxiety, Depression and Cognitive Disorders - Part 4

Methylation is another extremely important process for brain health. Methylation is relatively complex. I'm not going to go into a lot of detail on the basic biochemistry here, but I'm just going to talk about the relationship between methylation and mental health. Mutations in genes that are related to methylation can affect methylation status differently. MTHFR mutations can lead to undermethylation, and undermethylation can decrease serotonin production, raise the risk of depression, addiction, and OCD. Depression risk increases by 36 percent, for example, if they're homozygous for MTHFR C677T, whereas mutations in COMT and some other methylation-related genes can lead to overmethylation, and this affects the metabolism of catecholamines.

Overmethylation can lead to overproduction or just higher levels of serotonin, dopamine, and norepinephrine. That can increase the risk of anxiety, poor concentration, ADD, ADHD, and insomnia and can reduce stress tolerance. It can exacerbate how they're affected by stress.

Tests like 23andMe can show a genetic profile, and they can show which of these mutations that the patient has, but always remember that genes load the gun and environment pulls the trigger. Looking at the genes can only tell you what the patient is predisposed to. The mutations in these genes are highly prevalent, which means they're very common, but they have low penetrance, which means that their clinical significance is not high in the absence of other environmental risk factors. One of my pet peeves is when clinicians look at a genetic panel and make all kinds of supplement recommendations based on the genetic panel alone. I believe that that's irresponsible and not consistent with the scientific evidence. We need functional lab testing for methylation, like from Health Diagnostics and Research Institute, or Doctor's Data has a methylation panel, and there are other markers like homocysteine that can be used to give us a better idea of what's actually happening with methylation in conjunction with the genetic panel.

Let's talk a little bit about some therapeutic diets for mental health disorders. As I said, a balanced Paleo diet is a great starting place for most people—moderate protein, maybe 15 to 25 percent; moderate carbohydrate, somewhere between 20 percent and 40 percent; and then adequate healthy fats, somewhere between 30 and 60 percent. You want a high variety of plant and animal foods, and avoid foods that are most likely to cause sensitivities, like gluten and grains. Dairy is a gray area. I would have patients avoid it initially, but if you add it back in, pasture-raised, organic, full-fat, and fermented dairy can actually be really beneficial if they tolerate it well.

Another approach that can be helpful with patients who have significant gut issues is a low-FODMAP diet. You can use this particularly with patients with IBS or who already know that they're somewhat FODMAP sensitive. Elimination of high-FODMAP foods can reduce overgrowth of pathogenic bacteria in the small intestine; however, it's important to note that there's no evidence that a low-FODMAP diet will successfully treat or cure SIBO or other gut infections without an antimicrobial treatment, either botanical or pharmaceutical.

The other issue is that there are now a few studies that show that a long-term low-FODMAP diet, where all of these FODMAPs are removed, actually leads to undesirable changes in the beneficial bacteria in the colon, and that makes sense, right? These are a lot of the foods that feed that bacteria, so we need to be really careful as clinicians. We need to be wary of solving one problem in the short term and causing another problem in the long term. Given what we have learned in the past 10 years about the importance of the quantity and diversity of the beneficial bacteria in the colon, I'm reluctant to make recommendations to patients that will lead to reduced diversity and quantity of those bacteria. So what we recommend is that ultimately the patient reintroduce as many FODMAP foods as they possibly can to support the beneficial gut bacteria, and also try other non-FODMAP fermentable fibers like soluble fiber to feed that bacteria, because most patients, we've found, aren't universally sensitive to all of the FODMAPs. They might be particularly sensitive to garlic and onions, for example, but not as much to some of the fruits or some of the other FODMAP foods. That's really important to keep in mind.

Another specific dietary intervention that can be helpful for mental health disorders is the GAPS or Specific Carbohydrate Diet. This is a high-fat, high-glycine, and low-specific carbohydrate diet. I say "specific" because it's not necessarily low in carbohydrate, but it's low in complex sugars. It permits monosaccharides, simple sugars, found in fruits and some vegetables, things like honey, but it prohibits disaccharides and polysaccharides, more complex carbohydrates. It also removes many potential food allergens and many fermentable carbohydrates because those are the longer-chain polysaccharides. It can help heal gut dysbiosis, intestinal permeability, and reduce gut-brain symptoms. It's been successfully used with children with autism spectrum disorders and other mental and behavioral disorders. It's pretty popular in those communities and can be effective for various cognitive, behavioral, and mental health disorders in both kids and in adults, but as is often the case, you have to consider the individual patient. In some cases, I've seen patients with mental health disorders get significantly worse with this approach. I think it's certainly worth a try. It's definitely something we consider in our practice with kids on the autism spectrum and with things like ADHD and in adults that have this kind of constellation of symptoms, as well, but if you see that the patient is worsening and getting progressively worse and not better, it's not unusual to have an initial period of getting worse, but if the patient just continues to get worse, then I wouldn't continue with this strategy.

The other issue with this over the long term is if you remove all of the longer-chain carbohydrates, those are the ones that feed the beneficial bacteria in the gut, so you have the same issue as you have with the long-term low-FODMAP diet strategy.

Another option, of course, is a ketogenic diet. There are some studies showing this can be beneficial for treating cognitive and neurological disorders like Alzheimer's, Parkinson's, dementia, also mood disorders like depression, brain tumors, traumatic brain injury, and seizure disorders. It can help improve energy metabolism in the brain and reduce inflammation in the microglia. I do think it's worth experimenting with in people with these neurological and cognitive disorders particularly. It's the one area where I do use ketogenic diets in my practice and think of them. I also

will occasionally use them in severe blood sugar disorders, but it's really more neurological and cognitive disorders where I've found them to be helpful.

As a side note, even though ketogenic diets can be therapeutic in neurological and cognitive conditions, it's not necessarily preventative. If your patient, for example, has a family history of these conditions, we don't have any research showing that if they go on a ketogenic diet as a prophylactic that that's going to make a difference. As I've talked about before, I'm not a huge fan of a ketogenic diet just as a general approach for people that don't have a specific reason to do it. A very-low-carbohydrate diet may actually worsen certain neurological conditions, and we've seen that in our practice. It's very restrictive. It can trigger a kind of disordered eating pattern. We have at least some preliminary data, which is mostly anecdotal and not a lot of it has been published yet, but from the American Gut Project and observations from Jeff Leach that people on very-low-carb diets have different gut microbiota and patterns that are associated with possibly adverse health impacts. That's not surprising because many of the foods that feed the beneficial bacteria are carbohydrates, so if someone is on a very-low-carb diet and just eating mostly meat and fat and some non-starchy vegetables, then there may not be a lot of substrate available to feed the beneficial gut bacteria.

The other thing is that it's not always necessary to do a very-low-carb or zero-carb approach to produce adequate ketones. MCT oil, for example, can be consumed in fairly large quantities, and ketosis can be achieved with low-carbohydrate intake that's not necessarily very low. For example, Paul Jaminet, who wrote a book called *The Perfect Health Diet*, he has advocated what he calls a Perfect Health ketogenic diet with 100 grams of carbohydrates and a low protein intake plus large amounts of MCT oil and coconut oil, as well as ketogenic amino acids like leucine. There are different ways of approaching this, and like everything else, it's a good idea to experiment to see what works best.